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The invention relates to a method to the rinse cycle control in household dishwashers and an
apparatus to the carrying out the method after the preamble of Claim 1.

From DE 36 26 351 C2 is a "method for the operation of a program controlled dishwasher"
known. The multipart entire rinse cycle exhibits a forward-winding course, a cleaning rinsing
process and several intermediate rinsing processes. During forward-winding the degree of
pollution of the rinsing liquid determined is faded out, as well as with degree of pollution a
subsequent rinsing liquid change reduced in relation to a pre-determined degree of pollution and
transferred forward-winding liquid to the cleaning course. This prior art method is
characterized by the subsequent features:
that a single forward-winding course is provided,
that becomes measured in the cleaning rinsing process the degree of pollution,
that in the cleaning rinsing process a partial liquid change provided is and
that becomes performed in the Reinigungspülgang with inferior degree of pollution of the partial
liquid changes faded out and only a subsequent intermediate rinsing process with preceding,
complete rinsing liquid change.

For the execution of the prior art method at least a sensor is arranged in the rinsing system,
which emits a control signal dependent of the determined degree of pollution to the program
switching device. Different rinsing processes also different degrees of pollution become as
starting point for the detection of an inferior and/or. increased degree of pollution
predetermined.

As sensors come with the state of the art among other things into considerations:
a pressure sensor, that the delivery pressure of the circulating pump detected,
an optical sensor, which responds to the turbidity of the rinsing liquid,
a sensor, which the density of the rinsing liquid and/or. their flow rate detected,
a sensor, that the timed revolution number of the spray arms scans or
a sensor, which measures the achievement-dependent speed of the circulation pump drive
motor or its power input.

This prior art method is only in the layer, the degree and/or. to recognize the intensity of the
pollution and rinsing programs to co-ordinate thereupon; it does not recognize however the
type and origin of rinsing liquid impurities, which become caused by the most diverse leftovers
or similar Anschmutzungen.

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The invention has the object to create a method and an apparatus which beside the
determination of the rinsing water degree of pollution and/or. the dirt intensity also an analysis
concerning type and origin of the Geschirranschmutzungen possible and thereupon the rinse
cycle corresponding automatic and individual adapts.

This object becomes according to invention by the characterizing features of the claim 1
dissolved. Other advantageous embodiments of the invention are to be taken from the
Unteransprüchen.

The advantages achievable opposite the indicated state of the art result already from way of the object, i.e. from additional analyzing of the rinsing water kind of dirt and - mixes to determine. Thereby an ideal rinse cycle organization is possible. Brilliant rinsing results with other saving of energy, water and detergents are the sequence.

An embodiment of the invention is in the designs shown and becomes in the following more near explained.

It shows:

Fig. 1 the schematic illustration of a dishwasher in side view,

Fig. 2 a schematic cutout representation of the dishwasher front door with integrated rinsing liquid catch chambers,

Fig. 3 the schematic illustration of the rinsing liquid catch chambers after Fig. 2 in view A.

After Fig. 1 possesses a dishwasher as upper equipment cover a worktop 1. Inside their rinsing container 2 are arranged: Table-ware baskets 3 as well as spray arms 4. At the floor of the rinsing container 2 the emptying system is in form of an expiration tub 5 with not represented dirt filters as well as an emptying and a circulation pump. The front filling opening of the rinsing container 2 is lockable by a double walled door 6.

After Fig. 2 and Fig. 3 is into the inner wall of the door 6 horizontal adjacent rinsing liquid catch chambers 7 with common, transparent or transparent rear wall 7 min integrated. Above each rinsing liquid catch chamber 7 separate injectors are 8 9 arranged with Dosierkanülen. The rinsing liquid catch chambers 7 possess a common filling opening 10. Each rinsing liquid catch chamber 7 is further outside of located sensor a 11 associated, which is direct at the transparent rear wall 7 min placed. The rinsing liquid catch chambers 7 possess drain lines 12 and are emptyable over a common valve 13.

As from Fig. 2 apparent, is the common filling opening 10 of the rinsing liquid catch chambers 7 so formed and arranged that during the rinsing process into all rinsing liquid catch chambers 7 caustic solution is injected. The injectors 8 are with various indicator solutions filled and inject into it the associated rinsing liquid catch chamber 7. For each kind of dirt a special indication solution is provided, which one its typical color change of the rinsing water effected. With the help of the sensors 11 now color and/or intensity are queried, passed on to the control electronics in the form of signals and corresponding processed. If the inquiry cycle is ended, all rinsing liquid catch chambers become 7 13 emptied with the help of the valve.

In simplified version only a single rinsing liquid catch chamber is 7 arranged at the door 6, which becomes several times queried and emptied.

In accordance with Fig. 2 and Fig. 3 explained apparatus serves the recognition of the kind of dirt and the determination of dirt intensity and/or. Dirt quantity in the rinsing caustic solution, whereby the among other things subsequent criteria become taken as a basis and processed: with recognition of containing protein contaminants. . . Egg works foam-active, it made depending upon intensity either a complete water change or only a partial quantity of water exchange.
With recognition of stärkehaltiger contaminants. . . Increase of the rinsing water temperature (enzymhaltige cleaners used become: . . . Extension of the rinsing time).
With recognition of suspended particle (z. B. of vegetables). . . immediate water change, since due to kidnapping danger at the Spülgut back contamination could develop.
No or slight pollution. . . the emptying of a forward-winding course is omitted, to D. h. a water change is ausserprogrammässig faded out and/or. over-drive.

In simplified way a dirt recognition or an analysis is realizable with the help of a sensor technology and their signals, for example by bio sensors, over photometric sensors or by ultrasound sending sensor. Such sensors will supervise, steer positioned at arbitrary location in the water circulation and and change individual each complete expiration of rinse cycle.

Into analogue way the new method can come including apparatus also with electronic controlled household washing machines into application.